Coding Test Set 4

Program 1:
Given a number n, write an efficient function to print all prime factors of n.
For example, if the input number is 12, then output should be “2 2 3”. And if the input number is 315, then output should be “3 3 5 7”. Take input from command line argument.
Test Cases:
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1. VALID INPUT:
a) Only one argument will be given as input.
2. INVALID inputs:
a) No argument
b) Two or more than two arguments.
c) Characters other than integer
3. You should generate output as follows:
a) Print to the STDOUT without any additional text.
b) If error print 'ERROR' to the STDOUT without any additional text.

Program 2:
Write a program to rotate an array arr[] of size n by d elements. Take input from STDIN.
Example:
Input: arr[] = [1, 2, 3, 4, 5, 6, 7]
d = 2
Output: arr[] = [3, 4, 5, 6, 7, 1, 2]

Program 3:
Given an array, find the most frequent element in it. If there are multiple elements that appear maximum number of times, print any one of them. Take input from STDIN.
Examples:
Input: arr[] = {1, 3, 2, 1, 4, 1}
Output: 1
1 appears three times in array which is maximum frequency.
Input: arr[] = {10, 10, 20, 10, 20, 30, 20}
Output: 20
Both 10 and 20 appears three times which is maximum. So display either 10 or 20.

Program 4:
Write a program to replace a given character in a String to other provided characters, for example if you are asked to replace each blank in a String with %20, similar to URL encoding done by the browser, so that Server can read all request parameters.
For example if the input is "Java is Great" and asked to replace space with %20 then it should be "Java%20is%20Great". Take input from STDIN.

Program 5:
Given a 2D square matrix, find sum of elements in Principal and Secondary diagonals. Take input from STDIN.
Example:
Input:
4
1 2 3 4
4 3 2 1
7 8 9 6

6 5 4 3
Output:
Principal Diagonal: 16
Secondary Diagonal: 20

Program 6:
You are given a list of n-1 integers and these integers are in the range of 1 to n. There are no duplicates in list. One of the integers is missing in the list. Write an efficient code to find the missing integer. Take input from STDIN and display output to STDOUT without any additional text.
Example:
Input:
[1, 2, 7, 6, 3, 4, 8]
Output:
5

Program 7:
You are given a string, and a number k, and string length is greater than or equal to k. Write a program to find all k length substrings which are palindrome. Take input from command line argument.
Example:
Input:
academy
3
Output:
aca
Test Cases:
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1. VALID INPUT:
a) Only two argument will be given as input.
2. INVALID inputs:
a) No argument
b) One or more than two arguments.
c) String 2nd argument
3. You should generate output as follows:
a) Print to the STDOUT without any additional text.
b) If error print 'ERROR' to the STDOUT without any additional text.

Program 8:
Ugly numbers are numbers whose only prime factors are 2, 3 or 5. The sequence 1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 15, … shows the first 11 ugly numbers. By convention, 1 is included.
Given a number n, the task is to find n^{th} Ugly number. Take input from STDIN and display output to STDOUT without any additional text.
Examples:
Input: n = 7
Output: 8
Input: n = 10
Output: 12

Program 9:
Given two sorted arrays, print all elements that are not common of these arrays. Take input from STDIN and display output to STDOUT without any additional text.
Example:
Input:

arr1[] = {1, 3, 4, 5, 7}
arr2[] = {2, 3, 5, 6}
Output: {1, 2, 4, 6, 7}

Program 10:
Write a program to count the number of prime numbers formed by removing digits from that number from the back. (Including the number itself) Take input from STDIN and display output to STDOUT without any additional text.
Example: if n=131, 131 is prime no, 13 (by removing 1 from last) is also prime, but 1 is not prime, so Output = 2